

Radioisotope Power Supply, Phase II

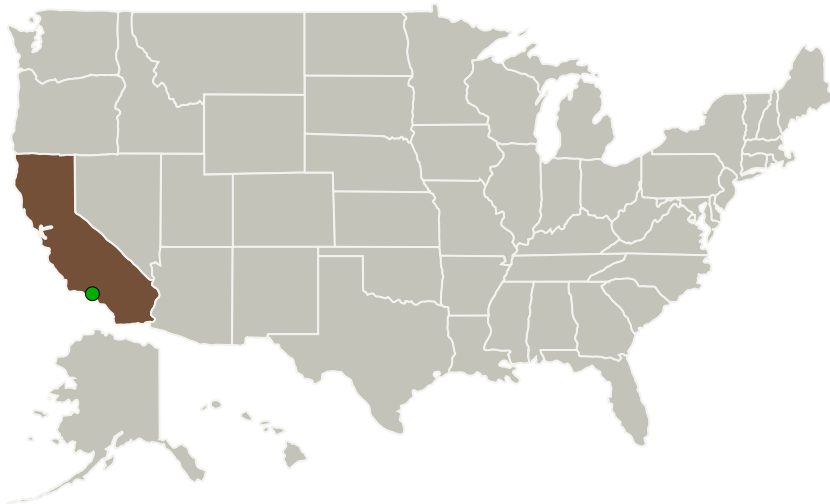
Completed Technology Project (2015 - 2018)



Project Introduction

Hi-Z Technology has designed, built and tested a small thermoelectric module that is well suited to use the 1 watt radioisotope heater unit (RHU) as a heat source. The RHU is commonly used on space missions to keep electronics warm. Combining the Hi-Z module with the RHU allows the RHU to provide up to 40mW of electric power and 960mW of thermal power to heat instruments. The availability of this proposed radioisotope power supply (RPS) would broaden the range of missions that can be addressed by mission planners by enhancing the ability of space probes and experimental packages to operate in conditions that were previously not possible. The 20 year life expectancy, solid state nature and high reliability of the RPS make it an ideal solution for a wide range of missions including lunar, Martian and deep space missions. The RPS technology is already proven having been used in applications exceeding ten years. The purpose of this proposal is to enhance the shock resistance of the RPS. Hi-Z's design can survive up to 2,000G's in its axial dimension and could easily survive launch. The proposed work will enable the RPS to survive shocks up to 10,000G's making it useful in a wider range of missions. The objective of the overall 3-Phase program is to design, build, test and deliver a new RPS to NASA that uses a 1Wt RHU heat source. The technical objectives of the Phase II effort are as follows: 1. Survive a 10,000 G shock 2. Deliver about 40mW of electrical power 3. Have a life expectancy of about 20 years (30mW at EOL)

Primary U.S. Work Locations and Key Partners



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Phase II

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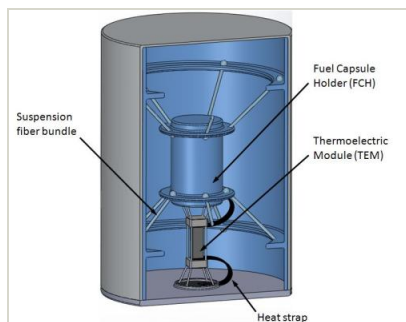


Organizations Performing Work	Role	Type	Location
HI-Z TECHNOLOGY, Inc.	Lead Organization	Industry Women-Owned Small Business (WOSB)	San Diego, California
● Jet Propulsion Laboratory(JPL)	Supporting Organization	NASA Center	Pasadena, California

Primary U.S. Work Locations

California

Images



Briefing Chart

Radioisotope Power Supply Briefing Chart

(<https://techport.nasa.gov/image/127532>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

HI-Z TECHNOLOGY, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

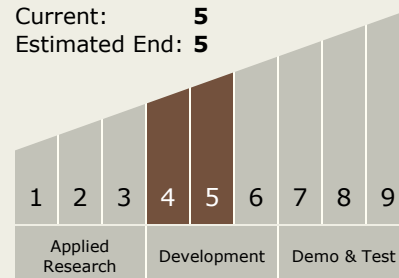
Carlos Torrez

Principal Investigator:

Frederick A Leavitt

Technology Maturity (TRL)

Start: 4
Current: 5
Estimated End: 5



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Technology Areas

Primary:

- TX03 Aerospace Power and Energy Storage
 - └ TX03.1 Power Generation and Energy Conversion
 - └ TX03.1.2 Heat Sources

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System